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END CONSONANTS AND BREATH-CONTROL IN FRENCH AND ENGLISH

In this article I desire to point out one essential and fundamental characteristic of French pronunciation.

If the phenomena of pronunciation were thoroughly understood, it would be possible for us to eradicate all traces of English accent in speaking French. The science of phonetics has usually failed, however, when applied to the teaching of French *l* and *r*. In my own experience, after years of work, faulty *l* and *r* remained. The manuals of Viëtor, Rousselot, and others had been assiduously studied and conscientiously followed, but even after long private instruction the incorrect pronunciation of *l* and *r* persisted when either of these consonants stood before another consonant or was final.

Especially had I tried to follow Abbé Rousselot in my efforts to correct my pronunciation of *l*. He describes *l* as follows: French *l*—s'articule avec la langue appuyée par la pointe sur le palais dans la région des dents et vibrant par les côtés sous l'effort de l'air aspiré. Elle est sonore dès le début.

Il ne semble pas que les variétés qu'on observe dans les points d'appui aient une valeur acoustique sensible, à moins que la pointe de la langue ne vienne s'appliquer trop en arrière, comme cela se produit chez les Anglais et surtout chez les Américains. . . . L'/l française n'est jamais vocalique comme en Anglais.¹

Abbé Rousselot ascribes the distinctive quality of French *l* to the position of the tongue during its production. I had experimented with the artificial palate² and in experiment the position of the tongue seemed correct; but as the sound of *l* was not satisfactory in reading and conversation, I assumed that for some reason the position was still faulty. While trying to correct the position, it occurred to me that as I had never been corrected for *l* at the beginning of a word or syllable all that would be necessary to obtain the correct position would be to make of final *l* an initial *l*. With this in mind, I practiced *fil* as follows: I said *fi*, then held the tongue and jaw in the position of *i* for some time after I had stopped all expulsion of air from the

¹ Rousselot, *Précis de prononciation française*, p. 58.

² *Op. cit.*, p. 22.

lungs, and, consequently, all production of sound; then, putting the tongue in position for *l*, I said *le*. After practicing for half an hour, I had acquired a muscular feeling for the movements involved; I pronounced *fi l'* rapidly, the space indicating a momentary stoppage of breath, and the apostrophe the explosion of the consonant. After a month's practice and care, I was no longer corrected for *l* by anyone. Using the false palate, I found too that I could now pronounce French *l* in the English position and English *l* in the French position. This seemed to indicate that the difference of position was not fundamental, but only incidental, and that the acoustic difference must be largely due to something else.

Similarly, I had never succeeded in pronouncing French *r* at the end of a word or before a consonant. Some months after correcting *l*, it occurred to me that there would be no harm in practicing *r* in the same manner. I chose (*je*) *parle* for this purpose, pronouncing slowly and carefully *pa r' le*, the space indicating a momentary stoppage of breath and the apostrophe the explosion of the consonant, while the *e* was "mute" *e*. The results were immediate and satisfactory, as in the case of *l*.

In these experiences with *r* and *l*, movement seemed of greater importance than position, and, believing that a comparative study of the mechanism of English and French pronunciation would give better results than an isolated study of either language, I began the following and other experiments with the *appareil inscripteur*¹ at the laboratory of experimental phonetics directed by Abbé Rousselot at the Collège de France.

In the experiments here described, the upper line, *N*, gives the vibrations of the larynx taken through the nose; the second line, *M*, the vibrations from the mouth; the lower line, *T*, the movement of the tongue. The vibrations from the nose, collected by means of a glass olive placed in one nostril (the other being left free), passed through a rubber tube into a shallow brass drum covered with india rubber, to which was attached a long lever bearing a gold pen that inscribed the vibrations on the smoked-paper surface of the cylinder of the apparatus. The vibrations from the mouth were obtained similarly, by speaking into a mouthpiece; and the movement of the

¹ For a description of the *appareil inscripteur*, see Rousselot, *Principes de Phonétique*, I, 61-101, or *Précis de prononciation française*, p. 14.

tongue was obtained by placing a small rubber bulb in the mouth at the point where the tongue approaches the hard palate, a perforation in the mouthpiece permitting it to be connected with the drum carrying the inscribing lever. The ascent of the line *T* corresponds

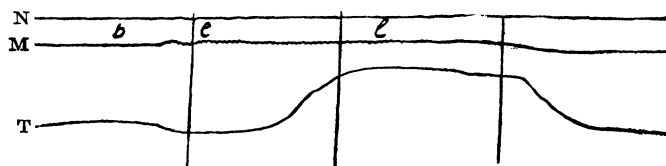


Fig. Ia

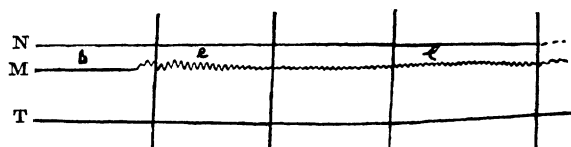


Fig. Ib

to the upward movement of the tongue toward the hard palate. To make the record permanent, the smoked paper was removed from the cylinder and varnished.

Fig. Ia presents a curve for French *l* (in *bel*) of considerable magnitude; the curve ascends rapidly, is held a moment, then descends rapidly. Fig. Ib offers a curve for English *l* (in *bell*) of little magnitude and of long, slow ascent.

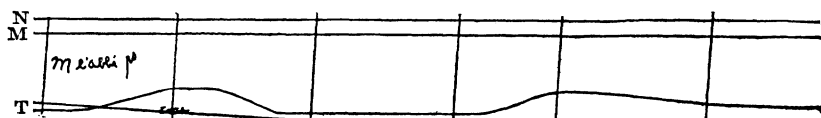


Fig. IIa

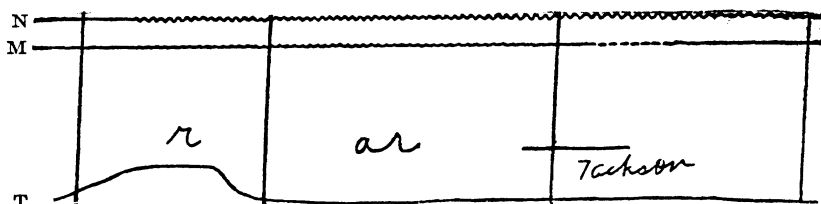


Fig. IIb

Fig. IIa represents Abbé Rousselot's pronunciation of the French word *rare*; and Fig. IIb, Mr. Jackson's (American) pronunciation of the English word *rare*.

Abbé Rousselot describes French *r* as follows:

L'*r* est un son vibrant qui peut se produire tout le long du canal vocal, des lèvres à l'isthme du gosier: de là ses nombreuses variétés. Elle est sonore en français dès le début. L'*r* traditionnelle se prononce avec la pointe de la langue redressée vers le palais.

Cette *r* est encore très commune. C'est celle que les professeurs du Conservatoire ont enseignée jusqu'à ces derniers temps aux Parisiens qui se destinent au théâtre.

Elle est, suivant les régions, plus ou moins roulée; mais elle doit l'être modérément.

L'*r* *grasseyée* ou *parisienne* se prononce la langue étendue sur le plancher de la bouche, la pointe raidie et arc-boutée contre les dents d'en-bas, la luvette projetée en avant. Les vibrations sont celles du dos de la langue et des bords de l'isthme du gosier.¹

As French *r* is usually trilled and as there are many varieties, it would seem that in order to escape unfavorable criticism an American would need but to trill *r*, either with the tip of the tongue or in the throat. Abbé Rousselot pronounces *r* with the tip of the tongue, and his *r* in no way offends Parisians; but trill *r* as he will, an American's *r* before a consonant or at the end of a word is rarely satisfactory.

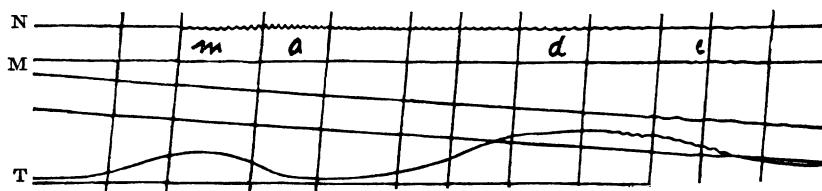


Fig. IIIa

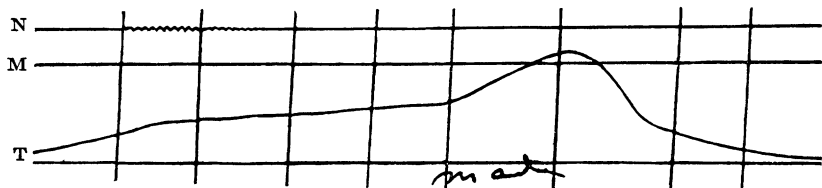


Fig. IIIb

The American subject for IIIa pronounced *made*; IIIb is the Abbé Rousselot's pronunciation of the same word. Here, as for

¹ Rousselot, *Précis de prononciation française*, pp. 56, 57.

l and *r*, the characteristic English and French curves occur at the end of the word.

Why have these final consonants in the English words less amplitude of curve than in the corresponding French words? The upward movement of the tongue begins earlier in the English sounds and continues through a greater period of time than in the French. English subjects move the tongue through the position of the various vowels, pronouncing continuously; French subjects take the position of the vowel definitely and with precision, hold that position during the duration of the vowel, then shift quickly, and pronounce the following consonant by means of an explosion, voiced for the voiced consonants, unvoiced for the mute consonants, but always following the consonant (cf. the *d* of English *and*, and the final *t* of *ant*, *contact*). The movement of the tongue in French, being sudden, as shown by the curve of the line *T* in Figs. Ia, IIa, and IIIb, imparts sufficient momentum to the inscribing lever to produce a curve of considerable amplitude; the movement of the tongue in English, beginning early and being slow and gradual, produces a curve of slight amplitude. This becomes clearer if one considers the analogous action of a camera shutter: if the camera bulb is compressed slowly, the shutter more often than not will not open, the air having had time to escape through the joints of the apparatus; on the contrary, if the bulb is compressed quickly, the shutter will open wide. That the difference of amplitude in the curves is not due to a difference of energy in the pronunciation of the two languages appears from a comparison of the curves of beginning consonants (cf. the initial *k*'s in Figs. IVa and IVb),¹

¹ Ordinarily it has been thought that French possessed implosive (final) consonants; and the difference between implosive (final) and explosive (initial) consonants has been explained as follows: "On dit que la tension est forte lorsque les organes se contractent fortement; on dit qu'elle est faible dans le cas contraire. . . .

"Lorsqu'une voyelle est suivie d'une consonne: *ap, af, am*, etc., la détente de la voyelle se confond avec la tension de la consonne. La tension ou l'implosion de la consonne est forte, sa détente ou explosion est faible. Elle peut même manquer si le souffle ou la voix s'arrêtent avant que les organes aient quitté leur position d'articulation. En français, avant une pause, la détente manque souvent dans les constrictives: *hôtel, fils*. Il en est de même dans les occlusives nasales: *madame, bonne*."—Roudet, *Éléments de Phonétique Générale*, p. 168. See also Rousselot, *Phonétique expérimentale*, I, 348, and Sievers, *Phonétik*, pp. 34, 174. If this explanation were true, in Fig. IVa the movement of the tongue would produce a greater curve for *n* in *contact* (English) than for *t* (Fig. IVb) in *contact* (French), as *n* is implosive and *t* explosive, and, in reality, owing to the slight difference in position, the tongue travels through a greater space in English than in French. But this is neither true here nor in similar cases elsewhere. Also, no experiment has offered an implosive (final) consonant in French.

where the movement of the tongue is as sudden in English as in French, and of the end *t* pronounced initially in *contact* (Figs. IVa and IVb).

And and *ant* (no figure) present curves very similar to the curve for medial *nt* in English *contact* (Fig. IVb). In *and* and *ant*, *n* is a final consonant, the sound being produced while the tongue is taking and holding the position; but, as the position of the tongue for *n* and *t* and *d* is the same, in taking the position for *n* the tongue interrupts

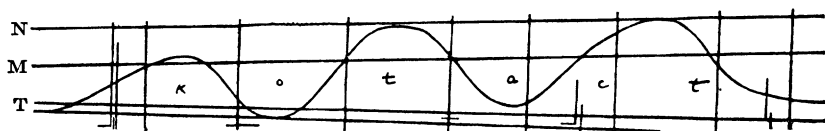


Fig. IVa

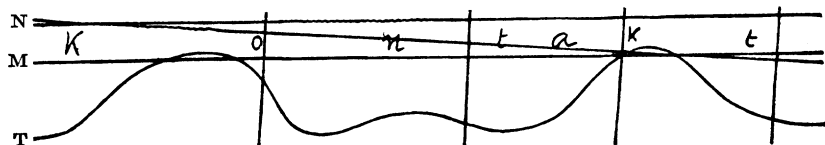


Fig. IVb

the current of air where it would otherwise be interrupted to produce the following *t* or *d*. *N* is produced while taking the position, and *t* or *d* while leaving the same position. The explosion of the *t* or *d* may be distinctly heard when the words are pronounced. If an attempt is made to suppress the explosion, the *t* or *d* will be suppressed at the same time. In English *contact*, the tongue does not intercept the current of air for *k* at the point where it would be intercepted for *t*, but farther back in the mouth, and, in this and similar cases, one may not only hear the explosion after the *t*, but note the large curve of the line *T* characteristic of initial consonants (Fig. IVb).

Medial *t* in the French word *contact* presents a curve (Fig. IVa) similar in amplitude to that of *k* at the beginning of the word, or of *t* at the end of it; in the English word the medial *nt* presents a very slight curve, but the final *t* offers a curve of great amplitude, thus presenting a seeming exception to the rule, as shown in the previous experiments. In view of the slight amplitude of the medial *nt* in English *contact* (Fig. IVb) and of the slight amplitude of the end

consonants in the first experiments, how is this large amplitude of the final *t* in English *contact* to be explained? In pronouncing English *contact*, one will observe the following process: while pronouncing the vowel *o*, the tongue is gradually moved into position back of the upper front teeth for *n*; *n* is produced while the tongue is taking and holding this position; on leaving this same position, *t* is pronounced. The final *t* of English *contact* (Fig. IVb), however, is not produced like medial *n*, while the tongue is taking and maintaining the required position, but while the tongue is maintaining and leaving the position; Fig. IVb offers an accident in English pronunciation: *k* preceding the end *t* is pronounced with the usual mechanism—while taking and holding the position; but incident to its production there is the shutting off of the whole current of air, thus rendering impossible the production of the end *t* in the same manner as the medial *n*, that is, by means of the preceding vowel and while taking and maintaining the required position; the final *t* must be pronounced, if at all, by means of a following explosion. For *t* and voiceless consonants this explosion is voiceless; for *d* in *and*, *cold*, and for voiced consonants in general the explosion is voiced.

In the manner of their production, the end *t* of *contact* (English) and the *d* of *and*, *cold*, are not final consonants at all, but initial. In this connection it is interesting to observe that many pronounce *contac* instead of *contact*, *an* instead of *and*. The pronunciation of an end consonant with the mechanism of a beginning consonant is contrary to the habits of English speech.

All end consonants in French, if analyzed with respect to the manner of their production, are not final at all, but initial, that is, produced by means of a following explosion. If this explosion occurs voiced, with the lips slightly advanced, it is mute *e*; if it takes place with the lips in a neutral position or unvoiced, it is heard as part of the consonant in the same manner as the explosion of *d*, *t*, in English *and*, *ant*. In English words the end consonants are normally final or produced by means of the preceding vowel while the vocal organs are assuming and maintaining the position characteristic of the consonant; initial consonants occur in English at the end of a word as the result of a phonetic necessity only, brought about by an accidental combination of consonants.

In the middle or at the end of a word does a Frenchman pronounce a double consonant? Is it not necessary that he produce a consonant while taking and maintaining the position as well as while maintaining and leaving the position? For instance, in pronouncing French *fat*, the tongue on assuming the *t* position stops the passage

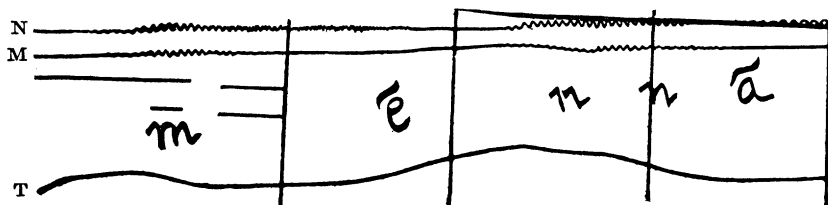


Fig. Va

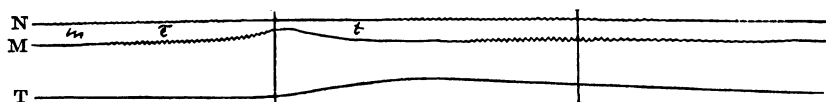


Fig. Vb

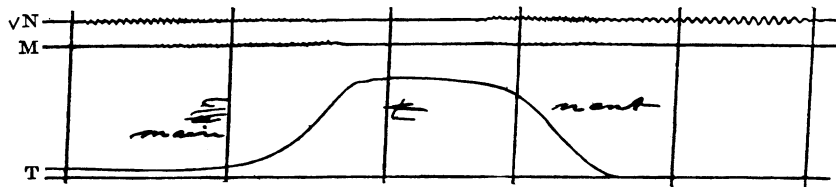


Fig. Vc

through the mouth, and, if the breath is not stopped from the lungs while the *t* position is being taken, final *t* is produced unavoidably. Does the Frenchman say *fa*, then stop the expulsion of air from the lungs while shifting the tongue into the *t* position, then produce pressure back of the tongue by expelling the air from the lungs again, and then release that pressure by withdrawing the tongue from the *t* position? Does the Englishman pronounce while shifting the position of tongue, jaw, etc., and while expelling the air from the lungs continuously?

This problem of breath-control is difficult of solution, as there are no instruments of sufficient delicacy and rapidity of action to register such a momentary stoppage of breath. This becomes

especially evident when it is recalled that any movement imparted to the apparatus tends to persist for a time after the exciting cause has ceased to operate. In Figs. *Va*, *Vb*, and *Vc*, however, the difficulty is avoided. Fig. *Va* is an example of a very frequent English pronunciation of *maintenant* and of all English words containing a nasal vowel followed by *t*, *d*, *k*, *g*, *p*, *b*. The slight curve of the line *T* indicates that *t* was pronounced by means of the preceding vowel while the tongue was assuming the *t* position, that is, the *t* is a final *t*. At the moment when the tongue reached the *t* position the soft palate was still lowered, permitting the air to pass through the nose for nasal *è*; but, since the difference between *n* and *t* is first that *n* is voiced, *t* mute, and then that for *t* the air passes through the mouth and for *n* through the nose, the English habit of pronunciation produces mechanically an *n* not intended by the speaker; this *n* may be seen in the large vibrations of the line *N*.

The expulsion of air could have been continuous (English mechanism of breath-control) and the *n* still avoided had the speaker closed the passage to the nose by means of the soft palate an instant before the closure made by the tongue was complete. Fig. *Vb* is an example of this; the upward curve of the line *M* is due to increased pressure on the rubber membrane over the drum at the moment when the tongue passes into the *t* position; in line *N* the vibrations stop at the moment of closure of the soft palate, but continue in line *M* until the tongue has taken position for *t*.

Fig. *Vc* offers the only other means possible of avoiding an *n* after a nasal vowel and before *t*. The large amplitude of the curve of the line *T* for *t* indicates that the *t* is initial. The slight downward tendency of the line *M* as the tongue assumes the *t* position indicates a decrease in air pressure (contrast with upward movement in Figs. *Va* and *Vb*), and the vibrations are seen to persist longer in the nose than in the mouth. This latter phenomenon is due to the fact that though the air has been stopped from the lungs, the vibrations already set up tend to persist longer in the comparatively closed passage of the nose than in the more open passage of the mouth.

Thus, in English, the expulsion of breath is continuous, transitions are long and gradual, and final consonants are the rule at the end of words; in French, an end consonant is preceded by a momentary

stoppage of breath and followed by an explosion, and transitions are made rapidly during this momentary stoppage of breath. In other words, *English* possesses “initial” and “final” consonants; *French*, “initial” consonants only, even at the end of a word.

Experiments would seem to indicate that what appeared true of *r* and *l* in the exercises for their correction (*fil, parle*) is true not only of *r* and *l*, and of all other French consonants, but that it is true also of all consonants of the Romance and Slav languages, and that what has been said of English consonants is characteristic of the Germanic group of languages.

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